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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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BRIDGESTONE AMERICAS HOLDING, INC. 1200 FIRESTONE PARKWAY AKRON, OH 44317			GUILL, RUSSELL L	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/698,318	Applicant(s) STUCKEY, JON IRVIN	
	Examiner RUSSELL GUILL	Art Unit 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 21-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 21-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/29/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to an amendment filed June 29, 2007. Claims 23 – 24 were added. No claims were canceled. Claims 1 – 18 and 21 – 24 are pending and have been examined. Claims 1 – 18 and 21 – 24 have been rejected.
2. This Office Action is NON-final due to new rejections.
3. **First, the Examiner would like to thank the Applicant for the very well presented response. The Examiner appreciates the effort to carefully analyze the Office Action, and make appropriate and clear arguments and amendments.**

Response to Remarks

4. Regarding the Information Disclosure Statement:
 - a. The new IDS has been considered.
5. Regarding the drawings:
 - a. The amended drawings overcome the objections.
6. Regarding the claim objections:
 - a. Applicant's amendments to the claims overcome the objections.
7. Regarding rejections under 35 USC § 112, second paragraph:
 - a. Applicant's arguments regarding claims 3, 17 and 21 regarding the meaning of "accumulation of the deviation of the arc length from the arc length of the mean pitch size" are persuasive.
 - b. Applicant's amendments to the claims overcome the rejections, except claim 15 where the terms "preferred" and "good" remain vague and indefinite.

8. Regarding independent claims 1, 15 and 21 rejected under 35 USC § 101:
 - i. Applicant's arguments have been fully considered, and are persuasive.
9. Regarding claims 1 – 14 rejected under 35 USC § 103:
 - a. Applicant's arguments are moot in view of new rejections.
10. Regarding claims 15 – 18 rejected under 35 USC § 103:
 - a. Applicant's arguments have been fully considered, but are not persuasive, as follows.
 - b. The Applicant argues:
 - c. The Office Action rejects claims 15-17 as being obvious in view of Sekula combined with Stuckey. Claim 18 has been rejected as being obvious in view of the Sekula/Stuckey combination in further view of Kogure. The Applicant respectfully traverses the rejections. As explained above, Sekula discloses a method for designing a pitch sequence from a desirable audio frequency spectrum while Stuckey discloses a secondary screening technique for analyzing the differences between competing pitch sequences such as those designed by Sekula. Claim 15 requires the design process to first define characteristics of tire noise attributed to the lug stiffness variations and then define the tire noise pitch sequence that yields the defined characteristics. Claim 15 thus has a completely different starting point for the pitch sequence design than the Sekula reference.
 - i. The Examiner respectfully replies:
 - ii. First, the following principles apply:
 - (1) Although claims of issued patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the mode of claim interpretation to be applied during examination. During examination, the claims must be interpreted as broadly as their terms reasonably allow. In re American Academy of Science Tech Center, 367 F.3d 1359, 1369, 70 USPQ2d

1827, 1834 (Fed. Cir. 2004). This means that the words of the claim must be given their plain meaning unless the plain meaning is inconsistent with the specification. In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) (discussed below); *Chef America, Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1372, 69 USPQ2d 1857 (Fed. Cir. 2004) (Ordinary, simple English words whose meaning is clear and unquestionable, absent any indication that their use in a particular context changes their meaning, are construed to mean exactly what they say).

iii. Sekula appears to meet the limitation because Sekula starts by producing a required audio frequency spectrum (figure 1, element 11, and column 3, lines 19 - 46), which obviously defines the characteristics of the tire noise generated by tire tread lug stiffness variations. Thus, Sekula appears to satisfy the first limitation of claim 15. Accordingly, the rejection is maintained.

d. The Applicant argues:

e. Stuckey does not provide motivation for changing the starting point of the Sekula design methodology to that recited in claim 15. Stuckey leads one of ordinary skill in the art to avoid undesirable results by testing a plurality of Sekula pitch sequences and selecting the one with the best results. Stuckey does not contain motivation for altering the design methodology of Sekula to achieve the invention of claims 15-17. The addition of the Kogure teachings does not change the result.

i. The Examiner respectfully replies:

ii. As discussed above, Sekula appears to satisfy the first limitation of claim 15, and therefore the argument does not appear to apply.

11. Regarding claims 21 – 22 rejected under 35 USC § 103:

- a. Applicant's arguments are moot in view of new rejections.

Claim Rejections - 35 USC § 112

12. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- a. **Claims 15 - 24** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- i. Regarding claim 15 and dependent claims, the claim recites in lines 4 – 5, “whereby preferred modulation characteristics and good level characteristics are provided”. The adjectives “preferred” and “good” appear to be vague and indefinite because one cannot determine the metes and bounds of the limitation.
- ii. Regarding claim 18, the claim recites in line 3, “the unique set of pitch sizes”. The term appears to have insufficient antecedent basis.
- iii. Regarding claim 21 and dependent claims, the preamble recites that the claim is for designing a tire noise pitch sequence, but the result of the claim does not appear to be a tire noise pitch sequence. The claim appears to be missing an essential element.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. **Claims 1 - 2, 6 and 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekula (U.S. Patent Number 4,442,499) in view of Kogure (U.S. Patent Number 5,383,506).

- a. The art of Sekula is directed to a method for producing pneumatic tires having pre-selected noise characteristics (Title and Abstract).
- b. The art of Kogure is directed to the art of pneumatic tires having reduced noise (Title and Abstract).
- c. The art of Sekula and the art of Kogure are analogous art because they both contain the art of noise reduction for pneumatic tires.
- d. Regarding **claim 1**:
- e. Sekula appears to teach:
 - i. selecting at least a first, a second, and a third modulation order (**figure 1, element 11, and figure 2A, spectral amplitudes and frequencies; it would have been obvious that at least three modulation orders were produced, especially in light of Kogure, figure 9**);
 - ii. defining the amplitude for each of the selected modulation orders; ~~the amplitudes of the first modulation and second modulation orders being smaller than or equal to the amplitude of the third modulation order~~ (**figure 1, element 11, and figure 2A; it would have been obvious that element 11 produced an amplitude of a modulation order; and figure 4; and column 2, lines 25 - 30; and column 4, lines 31 - 55; and column 10, lines 50 - 67**);

- iii. defining the phase for each of the selected modulation orders (**figure 1, element 12; it would have been obvious that element 11 produced a phase of a modulation order because in order for element 12 to sum the periodic functions cosine/sine, it would have required a phase; and figure 4; and column 2, lines 25 – 30; and column 4, lines 31 – 55; and column 10, lines 50 – 67**);
 - iv. creating a function for each modulation order that includes the defined amplitude and phase of the modulation order (**figure 1, element 12; it would have been obvious that element 12 produced a cosine and/or sine function for each modulation order; and figure 4; and column 2, lines 25 – 30; and column 4, lines 31 – 55; and column 10, lines 50 - 67**);
 - v. summing the created functions for each modulation order to define a summation of the functions (**figure 1, element 12; it would have been obvious that element 12 produced a wave that was the sum of the functions; and column 2, lines 20 – 25; and column 4, lines 31 – 55; and column 10, lines 50 - 67**);
 - vi. defining a tire noise pitch sequence from the summation of the functions (**column 2, lines 35 – 55; and column 10, lines 50 - 67**).
- f. Sekula does not specifically teach:
- i. ~~defining the amplitude for each of the selected modulation orders~~; the amplitudes of the first modulation and second modulation orders being smaller than or equal to the amplitude of the third modulation order;
- g. Kogure appears to teach:
- i. the amplitudes of the first modulation and second modulation orders being smaller than or equal to the amplitude of the third modulation order (**figure 9, graph of B6**);

h. The motivation to use the art of Kogure with the art of Sekula would have been the benefit recited in Kogure that the invention provides a pneumatic tire improved in comfort through an improved pitch arrangement to reduce pulsation sound pressure level (**column 3, lines 5 - 14**).

i. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Kogure with the art of Sekula to produce the invention of claim 1.

j. Regarding **claim 2**:

k. Sekula appears to teach:

i. calculating a determined number of pitch sizes from the summation of the functions (**column 2, lines 15 – 55; and column 10, lines 50 - 67**).

l. Regarding **claim 6**:

m. Sekula does not specifically teach:

i. selecting a total number of pitches, a number of different pitch sizes, and pitch ratios; and fitting the determined number of pitch sizes to the selected number of pitch sizes.

n. Kogure appears to teach:

i. selecting a total number of pitches, a number of different pitch sizes, and pitch ratios; and fitting the determined number of pitch sizes to the selected number of pitch sizes (**column 3, lines 5 – 45**).

o. Regarding **claim 11**:

p. Sekula does not specifically teach:

i. selecting between 3 and 7 modulation orders.

q. Kogure appears to teach:

- i. selecting between 3 and 7 modulation orders (column 3, lines 5 – 45; and figure 9).

15. **Claims 3 –5, 7 – 10 and 12 – 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekula as modified by Kogure as applied to **claims 1 – 2, 6 and 11** above, further in view of Stuckey (U.S. Patent Application 2003/0040886).

- a. Sekula as modified by Kogure teaches a method for designing a tire noise pitch sequence as recited in **claims 1 – 2, 6 and 11** above.
- b. The art of Stuckey is directed to the art of analyzing tire tread patterns for tire noise.
- c. Regarding **claim 3**:
- d. Sekula does not specifically teach:
 - i. using the accumulation of the deviation of the arc length from the arc length of the mean pitch size.
- e. Stuckey appears to teach:
 - i. using the accumulation of the deviation of the arc length from the arc length of the mean pitch size (paragraphs [0031] – [0039]).
- f. The motivation to use the art of Stuckey with the art of Sekula as modified by Kogure would have been the benefit recited in Stuckey that the invention allows eliminating tire designs having undesirable tire noise before sample tires are produced (paragraph [0026]).
- g. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Stuckey with the art of Sekula as modified by Kogure produce the invention of claim 3.
- h. Regarding **claim 4**:
 - i. Sekula does not specifically teach:

- i. interpolating a curve defined by the accumulation of the deviation of the arc length from the arc length of the mean pitch size.
- j. Stuckey appears to teach:
 - i. interpolating a curve defined by the accumulation of the deviation of the arc length from the arc length of the mean pitch size (paragraphs [0031] – [0039]).
- k. Regarding **claim 5**:
 - l. Sekula does not specifically teach:
 - i. selecting a total number of pitches, a number of different pitch sizes, and pitch ratios; and fitting the determined number of pitch sizes to the selected number of pitch sizes.
 - m. Kogure appears to teach:
 - i. selecting a total number of pitches, a number of different pitch sizes, and pitch ratios; and fitting the determined number of pitch sizes to the selected number of pitch sizes (column 3, lines 5 – 45).
- n. Regarding **claim 7**:
 - o. Sekula does not specifically teach:
 - i. setting the selected number of pitch sizes to a number between 3 and 7.
 - p. Kogure appears to teach:
 - i. setting the selected number of pitch sizes to a number between 3 and 7 (column 3, lines 35 – 40).
- q. Regarding **claim 8**:
 - r. Sekula does not specifically teach:

- i. identifying the range of determined number of pitch sizes and evenly dividing the identified range by the selected number of pitch sizes.
- s. Stuckey appears to teach:
 - i. identifying the range of determined number of pitch sizes and evenly dividing the identified range by the selected number of pitch sizes (paragraph [0040]).
- t. Regarding **claim 9**:
- u. Sekula does not specifically teach:
 - i. selecting the number of different pitch sizes to be 5 and selecting the pitch ratios to be 1.00, 1.10, 1.25, 1.40, and 1.50.
- v. Kogure appears to teach:
 - i. selecting the number of different pitch sizes to be 5 and selecting the pitch ratios to be 1.00, 1.10, 1.25, 1.40, and 1.50 (column 3, lines 5 – 45).
- w. Regarding **claim 10**:
- x. Sekula does not specifically teach:
 - i. selecting the number of different pitch sizes to be 3 and selecting the pitch ratios to be 1.00, 1.25, and 1.50.
- y. Kogure appears to teach:
 - i. selecting the number of different pitch sizes to be 3 and selecting the pitch ratios to be 1.00, 1.25, and 1.50 (column 3, lines 5 – 45).
- z. Regarding **claim 12**:
- aa. Sekula does not specifically teach:
 - i. defining the amplitudes of the first and second orders to be smaller than the amplitudes of the remaining orders.
- bb. Stuckey appears to teach:

- i. defining the amplitudes of the first and second orders to be smaller than the amplitudes of the remaining orders (**figure 2D**).

cc. Regarding **claim 13**:

dd. Sekula does not specifically teach:

- i. defining the amplitudes of the first and second orders to be zero.

ee. Stuckey appears to teach:

- i. defining the amplitudes of the first and second orders to be zero (**figure 2D**).

ff. Regarding **claim 14**:

gg. Sekula does not specifically teach:

- i. varying the amplitudes for the selected modulation orders.

hh. Stuckey appears to teach:

- i. varying the amplitudes for the selected modulation orders (**figure 2D**).

16. **Claims 15 - 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekula, in view of Stuckey (U.S. Patent Application 2003/0040886).

a. Regarding **claim 15**:

b. Sekula appears to teach:

- i. (a) first defining characteristics of the tire noise generated by a tire (**column 2, lines 37 – 45; and figure 1, element 11**);
- ii. (b) then defining a tire noise pitch sequence that yields the defined characteristics whereby preferred modulation characteristics and good level characteristics are provided (**column 2, lines 3 – 11 and lines 17 – 36; and column 10, lines 50 - 67**).

c. Sekula does not specifically teach (portions not taught are marked in **bold, italic, underline**):

- i. (a) first defining the characteristics of the tire noise *generated by tire tread lug stiffness variations*;
- d. Stuckey appears to teach:
 - i. tire noise generated by tire tread lug stiffness variations (**Abstract**);
- e. The motivation to use the art of Stuckey with the art of Sekula would have been the benefit recited in Stuckey that the invention allows eliminating tire designs having undesirable tire noise before sample tires are produced (paragraph [0026]).
- f. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Stuckey with the art of Sekula produce the invention of claim 15.
- g. Regarding **claim 16**:
- h. Sekula appears to teach:
 - i. Defining amplitudes of at least five modulation orders (**figure 1, element 11, and figure 2A, spectral amplitudes and frequencies; it would have been obvious that at least three modulation orders were produced, especially in light of Kogure, figure 9; figure 1, element 11; it would have been obvious that element 11 produced an amplitude of a modulation order; and figure 4; and column 2, lines 25 – 30; and column 4, lines 31 – 55; and column 10, lines 50 - 67**);
 - ii. Defining a phase for each modulation order (**figure 1, element 12; it would have been obvious that element 11 produced a phase of a modulation order because in order for element 12 to sum the periodic functions, it would have required a phase; and figure 4; and column 2, lines 25 – 30; and column 4, lines 31 – 55; and column 10, lines 50 - 67**);

- iii. Creating a function for each modulation order that includes the defined amplitude and phase of the modulation order (**figure 1, element 12; it would have been obvious that element 12 produced a cosine function for each modulation order; and figure 4; and column 2, lines 25 – 30; and column 4, lines 31 – 55; and column 10, lines 50 - 67**);
 - iv. Summing the created functions for each modulation order to create a wave Y having a curve (**figure 1, element 12; it would have been obvious that element 12 produced a wave that was the sum of the functions; and column 2, lines 20 – 25; and column 4, lines 31 – 55; and column 10, lines 50 - 67**);
- i. Regarding **claim 17**:
 - j. Sekula appears to teach:
 - i. Solving the equation to obtain a unique set of pitch sizes (**column 2, lines 17 – 36**).
 - k. Sekula does not specifically teach:
 - i. Defining a lug stiffness variation curve (D_i) to be the accumulation of the deviation of the arc length from the arc length of the mean pitch size;
 - ii. Setting the lug stiffness variation curve equal to the curve of the Y wave to define an equation;
 - l. Stuckey appears to teach:
 - i. Defining a lug stiffness variation curve (D_i) to be the accumulation of the deviation of the arc length from the arc length of the mean pitch size (**paragraphs [0031] – [0039]**);
 - ii. Setting the lug stiffness variation curve equal to the curve of the Y wave to define an equation (**paragraphs [0031] – [0039]**);

17. **Claims 18 and 23 - 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekula as modified by Stuckey applied to **claims 15 - 17** above, further in view of Kogure (U.S. Patent Number 5,383,506).

a. Sekula teaches a method for defining tire noise pitch sequences as recited in claim 15 above.

b. Regarding **claim 18**:

c. Sekula does not specifically teach:

i. selecting a total number of pitches, a number of different pitch sizes, and pitch ratios; and fitting the unique number of pitch sizes to the selected number of pitch sizes.

d. Kogure appears to teach:

i. selecting a total number of pitches, a number of different pitch sizes, and pitch ratios; and fitting the unique number of pitch sizes to the selected number of pitch sizes (**column 3, lines 5 - 45**).

e. The motivation to use the art of Kogure with the art of Sekula would have been the benefit recited in Kogure that the invention provides a pneumatic tire improved in comfort through an improved pitch arrangement to reduce pulsation sound pressure level (**column 3, lines 5 - 14**).

f. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Kogure with the art of Sekula as modified by Stuckey to produce the invention of claim 18.

g. Regarding **claim 23**:

- h. Sekula appears to teach:
 - i. Defining a level for a first modulation order, defining a level for a second modulation order, a level for a third modulation order (**figure 1, elements 11 and 12, and figure 2A, specified frequency components; it would have been obvious that at least three orders are generated, especially in light of the art of Kogure, figure 9**).
- i. Sekula does not specifically teach:
 - i. the levels of the first and second modulation orders being less than the level of the third modulation order.
- j. Kogure appears to teach:
 - i. the levels of the first and second modulation orders being less than the level of the third modulation order (**figure 9, graph for B6; shows that the modulation order for the first and second modulation orders are less than the order of the third modulation order**).
- k. Regarding **claim 24**:
- l. Sekula does not specifically teach:
 - i. Defining the level of the first modulation order to be zero and defining the level of the second modulation order to be zero.
- m. Stuckey appears to teach:
 - i. Defining the level of the first modulation order to be zero and defining the level of the second modulation order to be zero (**figure 2D**).

18. **Claims 21 - 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekula (U.S. Patent Number 4,442,499) in view of Kogure (U.S. Patent Number 5,383,506), further in view of Stuckey (U.S. Patent Application 2003/0040886).

a. The art of Stuckey is directed to the art of analyzing tire tread patterns for tire noise (**Abstract**).

b. Regarding **claim 21**:

c. Sekula appears to teach:

i. Defining an amplitude for each of the selected modulation orders (**figure 1, element 11, and figure 2A; it would have been obvious that element 11 produced an amplitude of a modulation order; and figure 4; and column 2, lines 25 – 30; and column 4, lines 31 – 55; and column 10, lines 50 – 67**);

ii. Defining a phase for each selected modulation order (**figure 1, element 12; it would have been obvious that element 11 produced a phase of a modulation order because in order for element 12 to sum the periodic functions, it would have required a phase; and figure 4; and column 2, lines 25 – 30; and column 4, lines 31 – 55; and column 10, lines 50 – 67**);

iii. Creating a function for each modulation order that includes the defined amplitude and phase of the modulation order (**figure 1, element 12; it would have been obvious that element 12 produced a cosine function for each modulation order; and figure 4; and column 2, lines 25 – 30; and column 4, lines 31 – 55; and column 10, lines 50 – 67**);

iv. Summing the created functions for each modulation order to create a wave Y having a curve (**figure 1, element 12, figure 2B; it would have been obvious that element 12 produced a wave that was the sum of the functions; and column 2, lines 20 – 25; and column 4, lines 31 – 55; and column 10, lines 50 – 67**);

- v. Solving the equation to obtain a unique set of pitch sizes (**column 2, lines 17 – 36**).
- d. Sekula does not specifically teach:
 - i. Selecting three, four, five, six, or seven modulation orders;
 - ii. Defining a lug stiffness variation curve (D_i) to be the accumulation of the deviation of the arc length from the arc length of the mean pitch size;
 - iii. Setting the lug stiffness variation curve equal to the curve of the Y wave to define an equation;
- e. Kogure appears to teach:
 - i. Selecting three, four, five, six, or seven modulation orders (**column 4, lines 10 - 15**);
- f. Stuckey appears to teach:
 - i. Defining a lug stiffness variation curve (D_i) to be the accumulation of the deviation of the arc length from the arc length of the mean pitch size (**paragraphs [0031] – [0039]**);
 - ii. Setting the lug stiffness variation curve equal to the curve of the Y wave to define an equation (**paragraphs [0031] – [0039]**);
- g. The motivation to use the art of Stuckey with the art of Sekula would have been the benefit recited in Stuckey that the invention allows eliminating tire designs having undesirable tire noise before sample tires are produced (**paragraph [0026]**).
- h. The motivation to use the art of Kogure with the art of Sekula would have been the benefit recited in Kogure that the invention provides a pneumatic tire

improved in comfort through an improved pitch arrangement to reduce pulsation sound pressure level (**column 3, lines 5 - 14**).

i. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Kogure and the art of Stuckey with the art of Sekula to produce the invention of claim 21.

j. Regarding **claim 22**:

k. Sekula does not specifically teach:

- i. Selecting a total number of pitches, five different pitch sizes, and pitch ratios of 1.00, 1.10, 1.25, 1.40, and 1.50;
- ii. Fitting the unique set of pitch sizes to the selected five pitch sizes.

l. Kogure appears to teach:

- i. Selecting a total number of pitches, five different pitch sizes, and pitch ratios of 1.00, 1.10, 1.25, 1.40, and 1.50 (**column 3, lines 5 - 45**);
- ii. Fitting the unique set of pitch sizes to the selected five pitch sizes (**column 3, lines 5 - 45**).

19. Examiner's Note: Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the Applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. The entire reference is considered to provide disclosure relating to the claimed invention.

Allowable Subject Matter

20. Any indication of allowability is withheld pending resolution of the outstanding rejections.

Conclusion

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russ Guill whose telephone number is 571-272-7955. The examiner can normally be reached on Monday – Friday 9:30 AM – 6:00 PM.

22. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Any inquiry of a general nature or relating to the status of this application should be directed to the TC2100 Group Receptionist: 571-272-2100.

23. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Russ Guill
Examiner
Art Unit 2123

RG

/Paul L Rodriguez/
Supervisory Patent Examiner,
Art Unit 2123